

CLAIM AMENDMENTS:

1. (currently amended) A control method of an external control system fan clutch wherein the interior of a sealing housing constructed by a case of a non-magnetic material supported through a bearing on a rotating shaft body fixedly attaching a drive disk to its tip and a cover attached to this case is partitioned by a partition plate into an oil reservoir chamber and a torque transmission chamber for internally mounting said drive disk by a partition plate; a dam is arranged in one portion of the inner circumferential wall face of the cover-sealing housing opposed to the outer circumferential wall portion of the drive disk for collecting and reservoiring oil at the rotating time, and a valve member comprising a spring material and having a magnetic property and being arranged within the oil reservoir chamber for closing an oil circulating flow passage formed in the partition plate between the torque transmission chamber and the oil reservoir chamber; an electromagnet is supported by said rotating shaft body through the bearing on the oil reservoir chamber side of said sealing housing, and a mechanism for controlling the opening and closing of the oil circulating flow passage, the method comprising:

biasing the valve member against the partition plate for keeping the oil circulating flow passage in a normally closed condition while keeping the valve member substantially free of magnetic forces acting thereon;

detecting a plurality of signals selected from: temperature of cooling liquid of a radiator, a fan rotating speed, temperature of transmission oil, vehicle speed, engine rotating speed, pressure of a compressor of an air conditioner and a turning-on or a turning-off signal of the air conditioner for determining a desired rotational speed of the sealing housing;

selectively operating the electromagnet in response to signals indicating a need for an increased rotational speed of the sealing housing for attracting the valve member and deflecting the valve member away from the partition plate for opening the oil circulating flow passage to permit a flow of oil into a torque transmission clearance between the drive disk and the sealing housing to increase an effective contact area of the oil in the torque transmission clearance; and

selectively turning off the electromagnet in response to signals indicative of a requirement for a slower rotational speed of the sealing housing so that the valve member is substantially free of magnetic forces and is biased into the normally closed condition by the spring material for controlling rotating torque transmission from a drive side to a driven side by increasing and decreasing an effective contact area of the oil in a-the torque transmission clearance portion formed by the drive side and the driven side; wherein the operation of electromagnet for opening said oil circulating flow passage and a turning off of the electromagnet so that the spring material biases the valve member against the partition plate for closing the oil circulating flow passage are controlled on the basis of a plurality of signals selected from the cooling liquid temperature of a radiator, a fan rotating speed, the temperature of transmission oil, a vehicle speed, an engine rotating speed, the pressure of a compressor of an air conditioner, and a turning on or turning off signal of the air conditioner.

2. (original) The control method of the external control type fan clutch according to claim 1, wherein a magnetic material of a ring shape is arranged between said electromagnet and the valve member, and is constructed by assembling the magnetic

material into the sealing housing so as to transmit a magnetic flux of the electromagnet to the valve member through the magnetic material.

3. (currently amended) A control method of an external control system fan clutch wherein the interior of a sealing housing constructed by a case of a non-magnetic material supported through a bearing on a rotating shaft body fixedly attaching a drive disk to its tip and a cover attached to this case is partitioned by a partition plate into an oil reservoir chamber and a torque transmission chamber for internally mounting said drive disk by a partition plate; a dam is arranged in one portion of the inner circumferential wall face of the cover sealing housing opposed to the outer circumferential wall portion of the drive disk for collecting and reservoiring oil at the rotating time, and a valve member comprising a spring material and having a magnetic property and being arranged within the oil reservoir chamber for closing an oil circulating flow passage formed in the partition plate between the torque transmission chamber and the oil reservoir chamber; an electromagnet is supported by said rotating shaft body through the bearing on the oil reservoir chamber side of said sealing housing, and a mechanism for controlling the opening and closing of the oil circulating flow passage, the method comprising:

biasing the valve member against the partition plate for keeping the oil circulating flow passage in a normally closed condition while keeping the valve member substantially free of magnetic forces acting thereon;

selectively operating the electromagnet in response to signals indicating a need for an increased rotational speed of the sealing housing for attracting the valve member and deflecting the valve member away from the partition plate for opening the oil circulating flow passage to permit a flow of oil into the torque transmission clearance

between the drive disk and the sealing housing to increase an effective contact area of the oil in the torque transmission clearance; and

selectively turning off the electromagnet in response to signals indicative of the requirement for a slower rotational speed of the sealing housing so that the valve member is substantially free of magnetic forces and is biased into the normally close condition by the spring material for controlling rotating torque transmission from a drive side to a driven side by increasing and decreasing an effective contact area of the oil in a the torque transmission clearance portion formed by the drive side and the driven side;
wherein the operation of the electromagnet for opening the oil circulating flow passage and a turning-off of the electromagnet so that the spring material biases the valve member against the partition plate for closing the oil circulating flow passage are controlled so that an upper limit rotating speed is set to an optimum fan rotating speed required from the engine side; a fan rotating speed control signal is temporarily stopped on the basis of the differential speeds between an engine rotating speed, the fan rotating speed and said optimum fan rotating speed; the fan rotating speed control signal is temporarily stopped on the basis of an engine rotating acceleration or an accelerator (throttle) position acceleration; or a limit is given to a changing rate of the optimum fan rotating speed on the basis of the changing rate of said optimum fan rotating speed.

4. (original) The control method of the external control type fan clutch according to claim 3, wherein a magnetic material of a ring shape is arranged between said electromagnet and the valve member, and is constructed by assembling the magnetic material into the sealing housing so as to transmit a magnetic flux of the electromagnet to the valve member through the magnetic material.